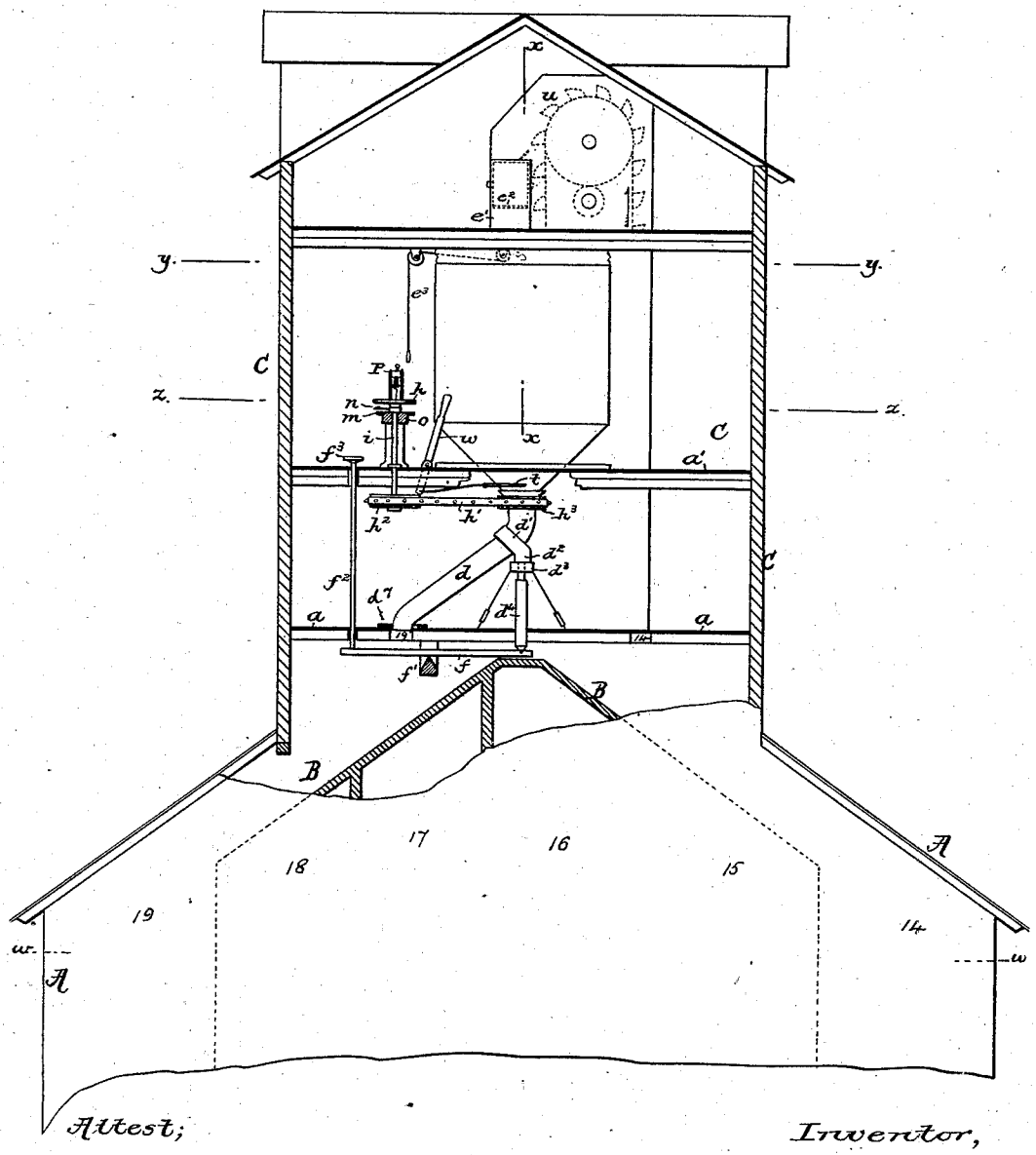
(No Model.) 3 Sheets—Sheet 1.

W. WATSON.

GRAIN ELEVATOR.

No. 282,425. Patented July 31, 1883.

Fig. 1.



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(No Model.) 3 Sheets—Sheet 2.

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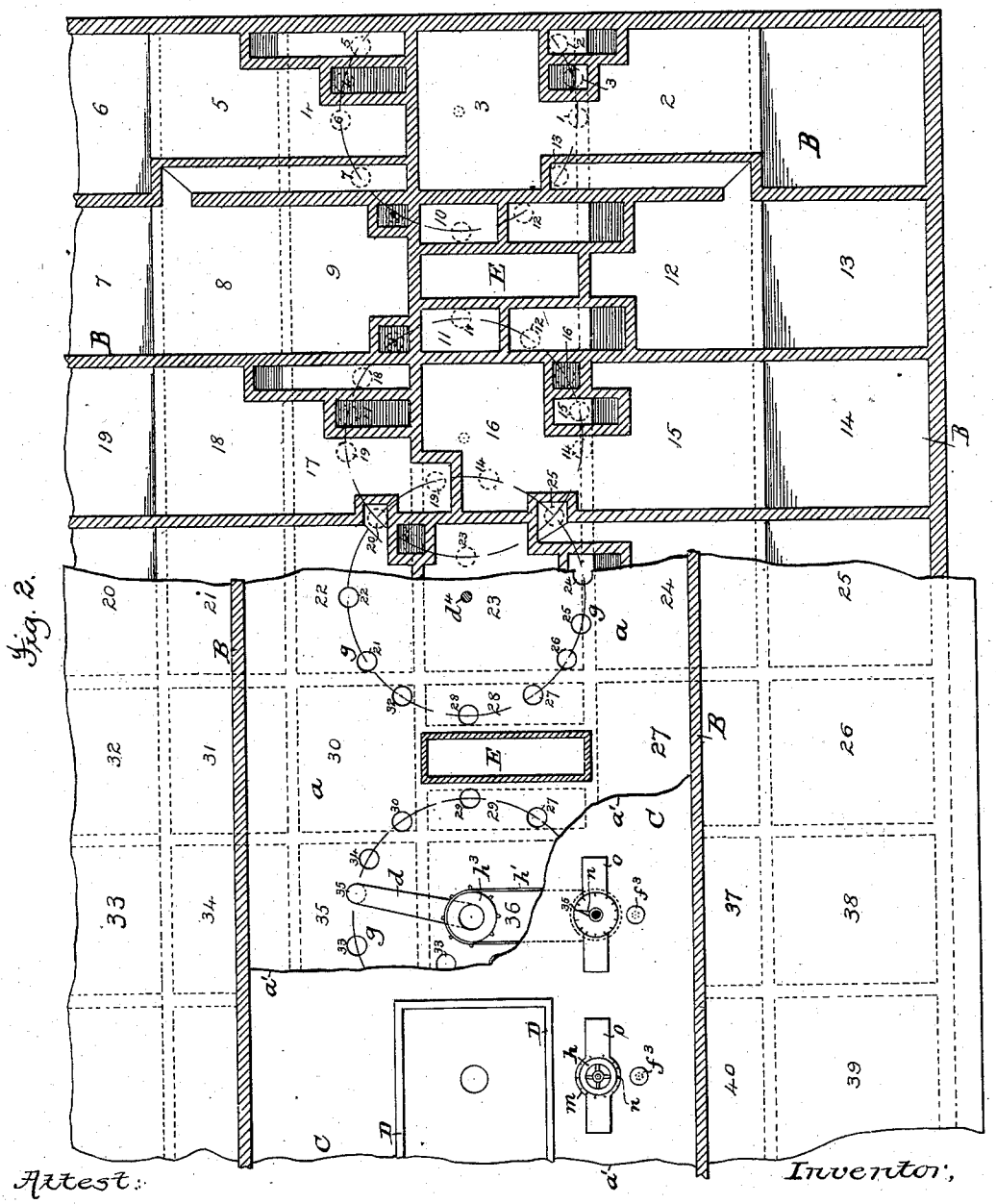
Fig. 2.



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(No Model.) 3 Sheets—Sheet 3.

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Fig. 3.

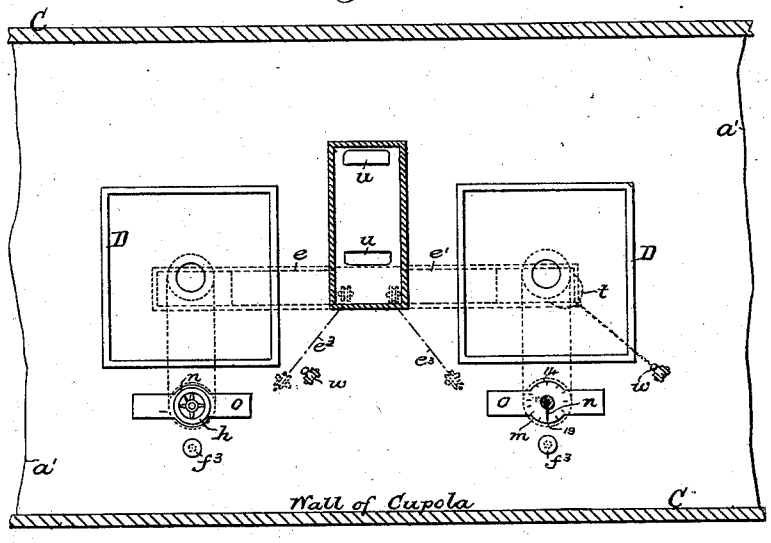
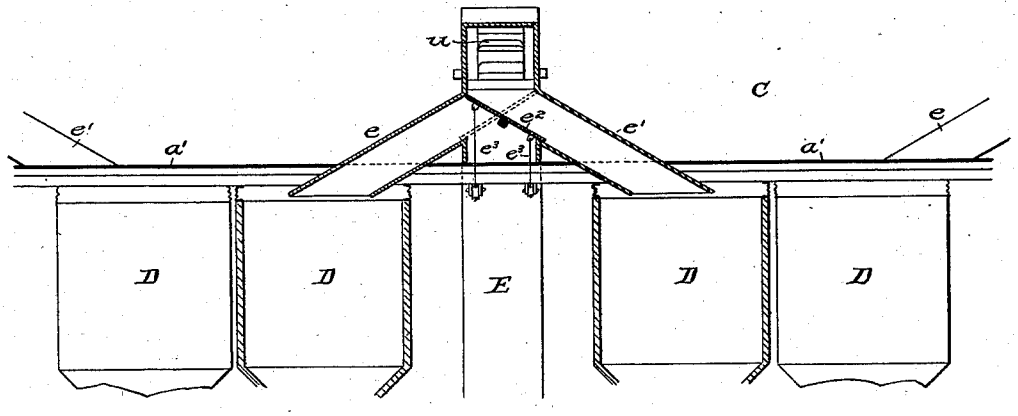


Fig. 4.



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Atty.

UNITED STATES PATENT OFFICE.

WILLIAM WATSON, OF CHICAGO, ILLINOIS.

GRAIN-ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 282,425, dated July 31, 1883.

Application filed June 1, 1883. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM WATSON, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Grain-Elevators; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this application.

My invention relates to certain improvements in grain-elevator buildings, which will be hereinafter more fully described, and specifically pointed out in the claims.

In the accompanying drawings, Figure 1 is a sectional end view of the upper portion of a grain-elevator building embodying my invention. Fig. 2 is a horizontal sectional view taken partially in a plane represented by line *z z* of Fig. 1 and partially on a plane represented by line *w w* of Fig. 1, and showing a portion of the second floor of the cupola broken away in order to bring in view a part of the first floor. Fig. 3 is a horizontal section through the cupola, taken at the line *y y* of Fig. 1. Fig. 4 is a longitudinal vertical section taken at the line *x x* of Fig. 1.

Similar letters of reference in the various views indicate similar parts.

At A is seen the upper portion of an elevator-building, and at B the cupola thereof, which latter is divided into three stories or spaces. In the first story, which is immediately over the tops of the grain-bins B of the building, I locate bin-supplying or feeder devices *d*, which lead from a line of weighing-hoppers, D, arranged longitudinally and centrally in the second story of the cupola C, and in the third story of the cupola I locate the upper discharging ends of the elevator-legs E.

The grain-bins B are so constructed that they practically extend up to the first floor, *a*, of the cupola, at which point their mouths are contracted or made to converge, so as to come within the range or sweep in sets of the lower ends of the series of revolving feeders *d*, depending from the bottoms of the weighing-hoppers D, as shown, and so as to be supplied through said feeders with the grain that may have been fed or discharged into the hoppers from the buckets of the elevator-belts. The series of grain-bins B, as usual, occupy the whole area of the building; and for the purpose of more clearly showing and explaining how those bins the bodies of which are located beyond the sweep of the revolving feeders (arranged, preferably, centrally and longitudinally of the building) are filled or supplied by said feeders, I have shown at Fig. 2 a part of the first floor, *a*, of the cupola broken away, so as to give a better view of the bins. I have also numbered the bins 1, 2, 3, &c., and have in like manner numbered the round openings in the floor (arranged, as shown, within the circles described by the lower ends of the revolving feeders) as well as the contracted mouth ends of the bins, and I shall hereinafter use these numbers of reference in describing the manner in which the grain, after having been elevated and weighed or measured, is conducted or supplied to any desired bin or bins.

The weighing-hoppers D are arranged in a series running lengthwise and centrally of the cupola, and each of said hoppers is adapted to supply through the medium of its feeder *d* a certain number or set of the bins B comprised in the series running throughout the building. Preferably I arrange these hoppers D in pairs between the elevator-legs E, and so that the revolving feeder *d* of either hopper may be set to discharge the contents of that hopper into one or more of the bins properly belonging to the circuit within which works the feeder of the other hopper, all as will be hereinafter more fully explained.

Immediately beneath each scale-hopper D is arranged one of the feeders *d*, adapted to convey the contents of said hopper into any one of a certain set of the bins B. The upper receiving-mouth of said feeder *d* is arranged concentrically with the discharging-aperture of the hopper D, while its lower discharging end is adapted to be swung around to register with and enter any one of a certain set of the holes *g*, (cut in a circle in the floor *a* of the cupola,) that communicate with a certain set of the bins, and is provided with a flange, *d'*, which helps support the feeder when its lower end is in the hole *g*, as well as prevents the escape of dust. In order that said feeder *d* may be set into and taken out of any of the circle of holes *g*, I make the same vertically adjustable, and effect its adjustment, preferably from the second floor, *a'*, of the cupola, by the

following means: Surrounding the feeder, at its upper bend, is a collar, d', provided at its lower portion with an extension, d^2, that rests and is supported on a bar, d^3, when the discharging-mouth of said feeder is entered in any of the holes g. This bar d^3 is perforated, and through this perforation passes the upper portion of a vertically-arranged post or rod, d^4, the upper end of which is securely fastened to the base of the extension d^2, while its lower end is stepped in or rests on one arm of a lever, f. The said lever f I preferably locate just underneath the first floor of the cupola, and hang on a knife-edge fulcrum, f', depending from below said first floor.

f^2 is a vertical rod extending from the second story of the cupola to the outer arm of the lever f, and provided at its upper end with a button or head, f^3, to form a suitable bearing-surface for the foot of the weigh-man. This button f^3 I preferably locate in close proximity to the scales and spout-operating device.

In Fig. 1 of the drawings the feeder d is shown in its normal position—that is, with its discharging end set in one of the holes g, cut in the circle around the floor, and adapted to conduct the grain from the hopper D down into one of the bins of the building. Now, if it be desired to turn said feeder around to engage with some other hole g of the circle, it must first be slightly elevated, so as to raise its discharging-mouth clear of the hole in which it is now set, and this elevation of the feeder is effected by the means just described, and in the following manner: The weigher or attendant applies foot-pressure on the button f^3, forcing down the rod f^2 and the outer arm of the lever f, and thereby raising the inner end of said lever, and with it the post d^4, which latter, being secured to the base of the extension d^2 of the collar, as described, in turn pushes up the collar and the feeder, around which said collar is firmly secured. The feeder having been pushed up sufficiently to raise its discharge end out of the hole in the floor, it may then, by means of the hand-wheel h and shaft i, chain h', and chain-wheels h^2 h^3, be swung or turned around to any other desired hole in the circle, and its discharging-mouth inserted in said other hole by simply releasing the foot-pressure at f^3, by doing which the feeder will descend by gravity, and all the parts regain their normal positions, as seen at Fig. 1. By the insertion of the discharge end of the feeder within the hole, the escape of dust is prevented during the flow of the grain from the hopper to the bins.

For the purpose of enabling the attendant to know positively, from his position on the second floor of the cupola, the exact location at all times of the discharging-mouth of the revolving feeder on the floor below him, I have provided an indicator, which I locate in the vicinity of the device for operating the turning feeders. In the drawings I have shown this indicator (composed of a dial, m, and pointer n) as arranged between the weighing-scale standard o and hand-wheel h, and this location, I have found in practice, is very convenient and desirable. The dial m of said indicator is stationary, and is marked or provided with numbers corresponding to the numbers of the bins and holes in the floor leading to such bins, while the pointer or hand n is fixed to and turns with the vertical shaft i, carrying the hand-wheel h and chain-wheel h^2.

At the right-hand side of Fig. 3 I have omitted the hand-wheel h, so as to give a better view of the indicator; and in lieu of numbering the whole face of the dial, (which might cause confusion,) I have simply put on the numbers "14" and "19," and in place of the other numbers, which in practice I mark the dial with, I have supplied short radiating lines, as seen.

Heretofore, in the construction of grain-elevator buildings, it has been customary to employ at the head of the elevator-belts a turn-head or revolving spout to direct the flow of grain from the top of the grain-elevator to different scale-hoppers; but to the use of such a device several objections exist, principal among which is that during the shifting of the spout from one hopper to another the flow of grain must either be stopped or else the grain scattered all over the floor in the path of the spout.

One of my present improvements has for its main object a construction by which the objection above recited is wholly avoided.

At the head of the elevator-leg E, I arrange a double stationary spout, e e', within which is suitably hung a damper-like valve, e^2, adapted to be turned and cut off communication with either leg of the double spout, and this turning of the valve e^2 I propose to accomplish from the second floor of the cupola and in the vicinity of the scale-beams and feeder-operating devices, so that all the work of filling the scale-hoppers, weighing the grain, and discharging the same into the bins of the building may be performed by one man stationed on the second floor of the cupola.

To each side of the pivot of the valve e^2, I fasten one end of a cord or chain, e^3, the other end of which I carry down through the third floor of the cupola, then around suitable guides or pulleys, s, arranged underneath said floor, and leave this end of the chain or cord hanging in the vicinity of the scale-beams, and within convenient reach of the weigh-master. It will be understood, of course, that one of the two ropes e^3 is carried to the vicinity of the scale-beams P of a weighing-hopper, D, on one side of the elevator-leg E, and the other rope to the vicinity of the scale-beams of a hopper located on the other side of the elevator-leg, all as shown at Fig. 3. The operation of this double hopper and valve device is as follows: The elevator-belts being in motion, the grain carried up by the bucket u thereof is discharged into the common mouth of the double spout, and if the valve e^2 be set as shown in full lines in Fig. 4 the grain will run down spout-leg e' in-

to the hopper D, while if the valve be set as indicated in dotted lines in this figure the grain will descend leg *e* of the spout; and it will be seen that either position of the valve (and the consequent direction of the flow of grain into either hopper) may be determined and secured by the weigh-man by merely pulling one or the other of the cords e^3.

It will be observed from an inspection of Figs. 2 and 4 that the hoppers D are arranged in pairs between the elevator-legs E. The broken-line circles in Fig. 2 indicate the paths described by the lower ends of the revolving feeders *d*, and it will be seen (from the middle pair of broken-like circles) that the revolving feeder of one hopper may be set to discharge grain from that hopper into either one of several of the bins properly belonging to the circuit within which works the revolving feeder of the next adjoining hopper. The accomplishment of this is a great desideratum, for I am enabled not only to readily mix different kinds or grades of grain, but to use whichever leg (of the two legs of the elevator between which are located a pair of hoppers) I find will be most convenient to carry up the grain through from the cars and sinks below.

In the use of an elevator embodying my improvements the grain is carried up through the elevator-legs E (by the usual bucketed belt) to the third story of the cupola, from whence it is discharged by the spouts *e e'* into the weighing-hoppers D D on the floor below. The hoppers are provided with suitable valvular devices, *t*, forming false bottoms to the hoppers while the weighing of the grain is being done, and these valves *t* are operated by suitable levers, *w*, within easy reach of the weigh-man. The grain discharged into the hoppers having been weighed or measured, the valves are opened and the grain permitted to descend through the feeders *d* in the first story into the bins of the building. The feeder located over bin 19, it will be observed, is capable by adjustment of conducting the grain from the hopper D down into any one of the bins 11, 12, 14, 15, 16, 17, 18, 19, 20, and 23, the mouths of said bins, as already stated, being built toward the circle described by the lower end of said feeder, (and toward the openings in the floor *a* of the cupola;) and it will be seen that during the turning around of the feeder the weigh-master can at all times tell its exact location by simply glancing at the dial and pointer before him. If it be desired to turn the feeder from the bin 19 to bin 14, the hand-wheel *h* is turned, and when the traveling pointer has arrived at No. 14 on the dial the weigh-man is apprised of the fact that the discharging-mouth of the feeder then registers with hole 14 in the floor and with the mouth of bin 14 of the building.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with the weighing-hoppers, located on the second floor of the cupola, with their turning-spouts depending below said floor, of a series of bins formed with contracted open mouths, substantially as set forth.

2. An indicator for the purpose set forth, located in the vicinity of the weighing-scales and the spout-operating device, so as to enable one operator to conveniently do the weighing of the grain in the hopper and the shifting of the revolving spout, as described.

3. In combination with a pair of weighing-hoppers, a double spout provided with a damper-like valve to shift the direction of the current of grain, substantially as set forth.

4. In combination with the double spout and damper-like valve, means for operating said valve from the second floor of the cupola and in the vicinity of the scale-beams and feeder-operating device, so that the same man can attend to the weighing and discharging of the grain from a given hopper into different bins, and also regulate the elevation of the grain into different hoppers, all substantially as set forth.

5. The combined arrangement of the contracted upper ends of the bins with the centrally-arranged series of hoppers, so that the revolving discharge-feeder of one hopper may be set to discharge the contents of that hopper into one of the bins properly belonging to the circuit into which works the revolving feeder of the next adjoining hopper, all substantially as set forth.

In witness whereof I have hereunto set my hand this 28th day of May, 1883.

WM. WATSON.

In presence of—

C. H. CHAMBERLIN,

J. W. CARTER.